NAVSEA
STANDARD ITEM

FY-00

ITEM NO: 009-45
DATE: 06 NOV 1998
CATEGORY: II

1. SCOPE:

1.1 Title: Tapered Plug Valve; repair

2. REFERENCES:

a. None.

3. REQUIREMENTS:

3.1 Matchmark valve parts.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean internal and external surfaces free of foreign matter (including paint), and inspect parts for defects.

3.3 Repair valve as follows:

3.3.1 Machine, grind, or lap and spot-in plug to bore to obtain an 80 percent minimum surface contact, evenly distributed over 100 percent of the area.

(V) "INSPECT CONTACT"

3.3.1.1 Inspect contact using blueing method.

3.3.1.2 Vertical misalignment of ports in the plug valve and body with the plug fully seated shall not be of a degree that will restrict flow.

3.3.2 Chase and tap exposed threaded areas.

3.3.3 Dress and true gasket mating surfaces.

3.4 Assemble valve installing new packing and gaskets in accordance with the manufacturer’s specifications, and new fasteners in accordance with Table One, or Table 2 for DDG-51 class.

3.4.1 Lubricate each MIL-V-24509 valve with grease conforming to MIL-G-6032.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

3.5.1.3 Master and backup test gages with gage range and graduation shown on Table 3.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) "SEAT TIGHTNESS"

3.5.2 Test for seat tightness with valve in closed position with opposite side open for inspection.

3.5.2.1 Plug shall be seated by hand force.

3.5.2.2 Test shall be continued for a minimum of three minutes if there is no evidence of leakage or, in the event of visible leakage, until accurate determination of leakage can be made.

3.5.2.3 Maximum allowable leakage for a metal-to-metal seated valve: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size. Valve sizes one inch or less may be 10 cc maximum per hour.

3.5.2.4 Allowable leakage for soft seated plug: None.

(V)(G) "SEAT TIGHTNESS"

3.5.3 Test plug valve of duplex strainer to each strainer chamber with unpressurized side top cover removed (two tests per strainer). Allowable leakage: With the drain valve closed the non-pressurized side shall not fill within one hour.

4. NOTES:

4.1 Test pressures of 3.5.2 and 3.5.3 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

TABLE ONE

VALVE BODY MATERIAL

	1/ Alloy Steel	Carbon Steel	2/ Nonferrous
3/ Studs and Bolts to MIL-S-1222	Grade B-16	Grade B-16	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A 4/
Nuts to MIL-S-1222	Grade 4 or 7	Grade 4 or 7	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A or Class B 5/
Socket Head Cap Screws	FF-S-86	FF-S-86	

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end and Class 5 fit on the stud and, except that a Class 3 fit with a thread locking compound may be used where temperatures do not exceed 250 degrees Fahrenheit. The thread locking compound shall conform to MIL-S-22473. Check Class 3 fit stud ends in accordance with DOD-STD-1371.

4/ Fasteners of Nickel Copper Aluminum shall be the only type used on sea chest and hull valves.

5/ Nuts of Nickel Copper Alloy, conforming to QQ-N-281 Class A or B, or Nickel Copper Aluminum conforming to QQ-N-286 shall be the only type used on sea chest and hull valves.

TABLE 2

VALVE BODY MATERIAL

	1/ Alloy Steel/Carbon Steel	2/ Nonferrous
3/ Studs and Bolts to MIL-S-1222	5/ For services up to and including 650 degrees Fahrenheit; Grade 5 steel	4/ 5/ Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A
	For services to 775 degrees Fahrenheit; Grade B-7 or B-16	
	For services to 1,000 degrees Fahrenheit; Grade B-16	
	For services in which JP-5 lubricating oil, or inflammable gas or liquid of any kind, regardless of pressure and temperature, which are within 3 feet of hot surfaces (above 650 degrees F) and where steel tubing is required; Grade 2, 5 or 8 steel	
	Bolting subject to sea water corrosion (other than hull integrity bolting; for hull integrity bolting see Note 4) Connections in contact with bilge regions. Where strength requires ferrous bolting and is exposed to the weather; Class A Nickel - Copper alloy to QQ-N-281 or silicon bronze to ASTM B98 with dimensions of MIL-S-1222. Where greater strength is required, use Nickel - Copper - Aluminum alloy QQ-N-286.	
Nuts to MIL-S-1222	5/ For services up to and including 650 degrees Fahrenheit; Grade 5 steel	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A or Class B 4/ 5/
	For service to 775 degrees Fahrenheit; Grade 2H or 4 steel	
	For services to 1,000 degrees Fahrenheit; Grade 4 steel	

TABLE 2 (CON'T)

	For services in which JP-5, lubricating oil, or inflammable gas or liquid of any kind, regardless of pressure and temperature which are within 3 feet of hot surfaces (above 650 degrees F) and where steel tubing is required; Grade 5 or 8 steel	
	Nuts subject to seawater corrosion. Connections in the bilge regions. Where strength requires ferrous material and is exposed to the weather; Class A or B Nickel Copper Alloy to QQ-N-281 or Silicon Bronze to ASTM B98 with dimensions to MIL-S-1222	

NOTES

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end and Class 5 fit on the stud end, except that a Class 3 fit with a thread locking compound may be used where temperatures do not exceed 200 degrees Fahrenheit. The thread locking compound shall conform to MIL-S-22473. Check Class 3 fit stud ends in accordance with DOD-STD-1371.

4/ Fasteners of nickel copper alloy shall be the only type used on sea chest and hull valves.

5/ Where these materials would constitute part of a galvanic couple, proposals for alternate materials shall be submitted for approval.

TABLE 3 - MASTER GAGE SELECTION FOR HYDROSTATIC TESTS

Maximum Test Pressure (lb/in^2g)		Master Gage Range (lb/in^2g)***		Master Gage Maximum Graduation Size (lb/in^2g)
From*	To**	From	To	
5000	9500	0	10000	100
3000	5800	0	6000	30
2500	4800	0	5000	30
1500	2800	0	3000	20
1000	1800	0	2000	15
750	1300	0	1500	10
500	800	0	1000	10
250	500	0	600	5
150	250	0	300	2
100	175	0	200	2
75	125	0	160	1
50	80	0	100	1
20	50	0	60	0.5
10	25	0	30	0.2
7	10	0	15	0.1
5	7	0	10	0.1

NOTES:

1. Master gage and back-up gages shall track within two percent of each other.

2. System maximum test pressures shall be determined by applicable overhaul specification, building specification, or other governing documents.

* Values agree with the requirement that gage range shall not exceed 200 percent of maximum test pressure except for gage ranges 0 to 60 and below.

** Values allow for reading pressures up to relief valve setting.

*** Exceptions to the values given in this table may be approved locally by Design, based on an evaluation of test pressure, gage range, and specific application.